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foundly influenced his contemporaries and immediate successors than Pestalozzi. . . . The purpose of the present work is to trace this movement (Pestalozzian) in the United States and to place on record the labors of a score of men who caught something of Pestalozzi's insight and enthusiasm and who sought to bring about a better order in the educational world by the adaptation of his reforms to the conditions of the new world."

For the purposes of orientation the author devotes the first chapter of his book to the spread of Pestalozzianism in Europe. The account is written in a clear and simple style and fulfills adequately the purpose of developing a background for the remaining ten chapters. Chapters II., III., IV., are devoted to an account, first, of William McClure, a Scotch philanthropist, who believed that in Pestalozzi's system he had discovered the educational clue to the permanent reforming of social conditions and who felt himself most powerfully drawn to the United States and its problems; secondly, to the activity of Joseph Neef, a coadjutor of Pestalozzi, who had been brought over to America by McClure to found and to superintend schools of the Pestalozzian order. Both accounts are simple and illuminating. Chapters V.–IX., inclusive, are devoted to an outline of the influence of Pestalozzianism as exhibited, first, in schools founded on the Pestalozzian plan and, secondly, in the careers of noted American educators (such as Alcott, Mason, Barnard, Sheldon, H. Kruse, Jr., W. T. Harris, and others) who had received inspiration and illumination from the work of Pestalozzi. Chapter X. is devoted to Pestalozzian literature in the United States, and Chapter XI. gives an excellent bibliography of the movement.

Taken in all, the volume is a readable and worthy introduction to the study of the American aspects of a movement which, in the past, has influenced education deeply and which, for the future, promises to be even more influential.

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Sur les fondements de l'arithmétique. C. LUCAS DE PESLOÜAN. *Revue de Philosophie,* April, May, June, 1907. Pp. 372–397, 489–509, 568–593.

We have here the most alluring criticism of modern mathematical logic which has yet been offered to philosophic readers. In the form of letters, the author relates the experience of a man who has heard of the "rational method" of dealing with exact science and makes use of a visit to Paris to acquaint himself therewith.

The work chosen as the basis of his studies is Laurent's "Sur les principes de la théorie des nombres et de la géometrie," a very unfortunate choice, for the work is far from being a model of its kind. At the outset he is hampered by the difficulty of putting aside presuppositions, even knowledge of counting, but he manfully makes the effort and commences the text. Four hypotheses take the place of traditional axioms, but such ideas as "one," "alternative," "dualism" appear, of which the knowledge was lost with that of counting, and also the student is compelled to add new hypotheses which the text fails to supply. Nevertheless he professes himself filled with enthusiasm and commends the new method for the instruction of the young, although confessing himself to retain, as a result of early education, a persistent longing for some intuitively certain axioms.

The second letter reports the results of a conversation at the bookseller's with a young philosopher, who astounds the writer with the idea of mathematics as a hypothetico-deductive system which is utterly heedless whether its postulates correspond to real things or common notions, but which aims solely at the development of non-contradictory systems; a mathematics which has as its ideal the attainment of a minimum of principles and postulates even if in so doing it seems artificial and paradoxical, or deduces evident propositions from the less evident. In order to be free from misleading connotations of words, a sign language is necessary, and he turns first to Couturat's "L'algébre de la logique," as an introduction to the "Principes de mathématiques" by the same author, and to Peano's "Formulaire."

The writer tells us how fine are the nominal definitions of zero, unity, finite and infinite, etc., and he is delighted to find that instead of "simple" ideas such as number and space, which Pascal accepted, the "natural light" reveals ideas of "class," "class of classes," "class of classes of classes," "implication," "relation," "correlation," "correspondence," "belonging to," "dependence," "function," etc., and, best of all, the postulates themselves are not ideas expressed in words, but mere assemblages of signs capable of being changed only by other assemblages of signs, also postulates. He must now not merely be ignorant of number, but of all intellectual things. Unfortunately, the method is not sufficiently developed to be used in elementary education!

Our student next encounters an aged engineer who passes his leisure in mathematical research. The new friend is not filled with enthusiasm for these researches of his and astonishes him with the information that there are great mathematicians, such as Poincaré, unversed and uninterested in them. Then he criticizes the whole movement from the mouth of Pascal. Commencing with the profound reservation that we are first shocked and only later find reasons, not *why* we are shocked, but *because* we are shocked, he opposes the method as being a complication of mathematics, fruitless in its results, and hostile to the creative imagination. Also the attempt at a complete symbolization of concepts is ridiculous.

No brief review can give an adequate presentation of the profound appeal of the serious criticism half hidden in these humorously written letters. But we should not be too hasty in letting M. de Pesloüan persuade us to neglect attempts to reconstruct the logic of mathematics. Poincaré himself, the most severe critic of the movement, has recognized two types of mathematical minds,[1] the one intuitively inductive and the other critically deductive; to the former belong the great discoverers, to the latter the selective critics who develop and perfect discoveries and weed out falsehoods sometimes taken for truths. If mathematical logic were pushed to an extreme and proposed as the tool of the former of these types of minds, such criticism as the above would be merited, but such critics as M. de Pesloüan forget its meaning for mathematicians of the other type.

To view mathematics as hypothetico-deductive is already critically to recast existing systems, of which the empirically traceable origin is generally far from deductive. Surely new systems, perhaps trivial, can be developed deductively from arbitrarily chosen postulates, but this is done in practise only for the critical reaction of such systems on those already existing. But the method viewed as functioning critically lets our author's criticisms fall harmless. The postulates are indeed artificial, but if they are recognized as the results of analysis rather than as bases of creative generation, half the reproach in this vanishes and the remainder is gone when we relate them to the demands of simplicity. Simplicity is a difficult notion to define. What is simple for one purpose is for another highly complex, and the only fair test of simplicity for notions in postulates is the pragmatic one, what notions work best for the use we wish to make of them. Judged thus, there is a good deal to be said for those so strenuously objected to by our author and by many philosophers and mathematicians. To see the one in the many is certainly a simplification, and these notions, however complex they may appear to intuition, at least enable us to connect formal logic, the various branches of analysis, and geometry in a very close and remarkable fashion when they would otherwise appear as comparatively isolated branches of learning.

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The Phenomenal Sanctions of the Moral Life. F. C. DOAN. *Mind,* N. S., No. 62, April, 1907. Pp. 196–208.

Mr. Doan evidently belongs to the militant school of Mr. F. C. S. Schiller. He is strongly—one may infer, temperamentally—opposed to the intellectualistic rigidities of absolutism, an ardent advocate of "the newer hedonism" and "the newer pluralism." And he is in the main an effective advocate, although he would not weaken his case by the use of more measured rhetoric.

The present article is an application of the general position set forth by the same writer in an earlier article in *Mind* (N. S., 54) entitled "Phenomenalism in Ethics," in which he maintains that, ethically, reality is incomplete and indeterminate; that the psychological self of "functional identity" is adequate for ethics; and that ethical sanctions inhere

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[1] "La valeur de la Science."